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09/896,999	07/02/2001	Koichiro Kezuka	09792909-5106	1156

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EXAMINER

WILLS, MONIQUE M

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 04/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Applicant(s)

09/896,999

Applicant(s)

KEZUKA ET AL.

Examiner

Wills M Monique

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_\_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2003.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-44 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 02 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Response to Amendment*

This Office Action is responsive to the Amendment filed October 2, 2003. The rejection of claims 1-3, 8-10 & 15 -17 under the judicially created doctrine of double patenting over claims 1, 26 & 27 of 09/862,621 of copending Application No. 09/862,621, filed May 22, 2001, in view of Olsen U.S. Patent 5,518,839, is withdrawn. The rejection of claims 1-21 under 35 U.S.C. 103(a) as being unpatentable over Gan et al. U.S., Patent 6,350,546 and further in view of Peled et al., U.S. Patent 5,472,808 is overcome. The rejection of claim 22 under 35 U.S.C. 103(a) as being unpatentable over Gan et al., U.S. Patent 6,350,546 and further in view of Takami et al., U.S. Patent 6,503,657 is overcome.

The new rejections necessitated by amendment are as follows:

- Claim 27 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
- Claims 23-27, 42 & 44 are rejected under 35 U.S.C. 102(e) as being anticipated by Skotheim et al. U.S. Patent 6,482,545.
- Claims 23-26, 28, 31-33 & 42-44 are rejected under 35 U.S.C. 102(e) as being anticipated by Ochiai et al., U.S. Patent 6,569,572.

- Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi et al., U.S. Patent 6,692,863 in view of Skotheim et al. U.S. Patent 6,482,545.
- Claim 22 rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi et al., U.S. Patent 6,692,863 in view of Skotheim et al. U.S. Patent 6,482,545, as applied to claim 15 above, and further in view of Takami et al. U.S. Patent 6,503,657.
- Claims 29 & 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ochiai et al., U.S. Patent 6,569,572, as applied to claim 23 above, and further in view of Nakanishi et al., U.S. Patent 6,692,863.
- Claims 36 & 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ochiai et al., U.S. Patent 6,569,572, as applied to claim 23 above, and further in view of Hamamoto et al, U.S. Patent 6,436,582.
- Claims 28,31-36 & 38-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Skotheim et al., U.S. Patent 6,482,545 as applied to claim 23 above, and further in view of Takami et al., U.S. Patent 6,503,657.

*Specification*

The disclosure is objected to because of the following informalities: on page 5, line 10, vanadium oxide is erroneously categorized as a metal sulfide. Appropriate correction is required.

*Claim Interpretation*

According to Merriam Webster's Collegiate Dictionary, a "foil" is "a very thin sheet metal". Therefore, the examiner will interpret metal sheets having a small "mm" thickness, such as 1mm, as a foil.

*Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 27 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

"V<sub>2</sub>O<sub>5</sub>" is erroneously categorized as a metal sulfide. Appropriate correction is required.

*Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 23-27, 42 & 44 are rejected under 35 U.S.C. 102(e) as being anticipated by Skotheim et al. U.S. Patent 6,482,545.

Skotheim teaches a non-aqueous electrolyte comprising (a) one or more solvents (b) one or more ionic salts and, (c) a multifunctional monomer comprising two or more unsaturated aliphatic reactive moieties per molecule (abstract). With respect to claim 23, Skotheim teaches a battery comprising a positive electrode, negative electrode and an electrolyte with a multifunctional monomer (col. 8, lines 35-48). Concerning claims 24 and 25, the positive electrode comprises a mixture layer and an aluminum current collector (col. 24, lines 30-45). With respect to claims 26 & 27, the cathode is vanadium oxide or a metal sulfide (col. 19, lines 50-60). With respect to claims 42 and 44, the electrolyte contains an ether (col. 9, lines 40-48) and two or more polymerized functional groups in a molecule (abstract). Therefore, the instant claims are anticipated by the prior art set forth.

*Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 23-26, 28, 31-33 & 42-44 are rejected under 35 U.S.C. 102(e) as being anticipated by Ochiai et al., U.S. Patent 6,569,572.

With respect to claims 23 & 42-44, Ochiai teaches a lithium battery comprising a positive electrode, negative electrode and electrolyte; wherein the electrolyte contains di(metha)-acrylic ester compounds (col. 2, lines 45-65). With respect to claims 24 and 25, the positive electrode comprises a mixture layer and an aluminum current collector (col. 11, lines 45-60). With respect to claim 26, the cathode active material is  $\text{LiCoO}_2$  (col. 11, lines 50-60). With respect to claim 28, the anode comprises a current collector (11) and active material mixture (col. 11, lines 45-60). With respect to claim 31-33, the anodic active material is carbon (col. 11, lines 45-60). The instant claims are anticipated by the prior art set forth. The limitation in claim 23, with respect to the electrolyte containing a multifunctional monomer, is considered to be an inherent property of the acrylic ester as set forth in the prior art, because Ochiai employs the same acrylic ester electrolyte additive set forth by Applicant. The limitation in claim 44,

Art Unit: 1746

with respect to the multifunctional monomer having more than two polymerized function group in a molecule, is considered to be an inherent property of the acrylic ester as set forth in the prior art, because Ochiai employs the same acrylic ester electrolyte additive set forth by Applicant.

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi et al., U.S. Patent 6,692,863 in view of Skotheim et al. U.S. Patent 6,482,545.

With respect to claims 1, 8 & 15, Nakanishi teaches a battery comprises a positive electrode, negative electrode and a negative electrode collector plate with a two-layer structure including a copper layer and a metal layer made of a metal not forming an intermetallic compound with lithium (abstract). With respect to claims 2, 3, 9, 10, 16 & 17, the metal layer is a metal more noble than copper with respect to oxidation-reduction potential, such as nickel or chromium (col. 5, lines 40-41). In re claims 5, 6, 12, 13, 19 & 20, the anodic material is a material capable of occluding and



Art Unit: 1746

releasing lithium such as graphite, coke or carbon (col. 14, lines 20-25). With respect to claims 7, 14 & 21, the cathodic material is a lithium composite oxide (col. 14, lines 15-20).

Nakanishi is silent to the electrolyte containing multifunctional monomers (claims 1, 8 & 15) or synthesizing the polymer at 95°C or lower (claims 4, 11 & 18).

Skotheim teaches that it is conventional to employ multifunctional monomers in electrolytes to improve safety of the cell by rapidly polymerizing at elevated temperatures to increase the viscosity and internal resistance of the electrolyte (abstract).

Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the instant invention was made, because even though Nakanishi does not teach electrolytes containing multifunctional monomers, Skotheim teaches that multifunctional monomers improve safety of the cell by rapidly polymerizing at elevated temperatures to increase the viscosity and internal resistance of the electrolyte.

With respect to the collector layer of Nakanishi being a foil, the thickness of the collector plate is 1 mm (See Table 10), and therefore, by definition, is a foil.

With respect to claims 4, 11 & 18, the claims are product-by-process claims, that require polymerizing the polymer compound at 95° C or lower. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not

depend on its method of production. If the product in the product - by - process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 227 USPQ. In the instant case, even though the electrolyte was made by different processes, claims 4, 11 & 18 are unpatentable because it appears that the final product made of Nakanishi in view of Skotheim is the same as the subject invention, unless Applicant's can show that the process materially changes the final product.

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi et al., U.S. Patent 6,692,863 in view of Skotheim et al. U.S. Patent 6,482,545, as applied to claim 15 above, and further in view of Takami et al. U.S. Patent 6,503,657.

Nakanishi in view of Skotheim teach a battery comprising a multifunctional monomer as described herein above.

Nakanishi is silent to the casing comprising a polymer compound film, a metal film, and a polymer compound film laminated in that order.

Takami teaches that it is conventional to employ protective layers on both surfaces of the metal film casing of a nonaqueous lithium battery (col. 11, lines 1-5). The protective layers prevent the metal casing from being corroded by the nonaqueous electrolyte (col. 11, lines 5-10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the protective layers assembly of Takami in the cell of Nakanishi, in order to prevent the metal casing from being corroded by the nonaqueous electrolyte.

With respect to the collector layer of Nakanishi being a foil, the thickness of the collector plate is 1 mm (See Table 10), and therefore, by definition, is a foil.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 29 & 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ochiai et al., U.S. Patent 6,569,572, as applied to claim 23 above, and further in view of Nakanishi et al., U.S. Patent 6,692,863.

Ochiai teaches a battery comprising a multifunctional monomer as described hereinabove. The disclosure includes a negative electrode and current collector (col. 11, lines 50-60).

Ochiai is silent to a collector layer comprising a copper foil covering a metal wherein the metal is not copper and does not form an alloy with lithium (claims 29 & 30).

Nakanishi teaches that it is conventional to employ negative current collectors comprising copper covering a metal that does not alloy with lithium (abstract), in order to improve current collector efficiency of the negative electrode (col. 3, lines 25-30).

Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the instant invention was made, because even though Ochiai does not teach a collector layer comprising a copper foil covering a metal, wherein the metal is not copper and does not form an alloy with lithium, Nakanishi teaches negative current collectors comprising copper covering a metal that does not alloy with is beneficial to improve current collector efficiency of the negative electrode.

With respect to the collector layer of Nakanishi being a foil, the thickness of the collector plate is 1 mm (See Table 10), and therefore, by definition, is a foil.

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 36 & 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ochiai et al., U.S. Patent 6,569,572, as applied to claim 23 above, and further in view of Hamamoto et al, U.S. Patent 6,436,582.

Ochiai teaches a battery comprising a multifunctional monomer as described hereinabove. The disclosure includes a negative electrode comprising carbonaceous active material (col. 11, lines 50-60).

Ochiai is silent to an active material such as tin oxide (claims 36 & 37).

Hamamoto teaches the functional equivalence of carbonaceous material and tin oxide as anodic material in lithium batteries.

Therefore, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the instant invention was made because even though Ochiai does not teach tin oxide active material, Hamamoto teaches that carbonaceous material and tin oxide are art recognized equivalent materials for anodes in lithium batteries, and therefore, one having ordinary skill in the art would have substituted one active material for the other.

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 28,31-36 & 38-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Skotheim et al., U.S. Patent 6,482,545 as applied to claim 23 above, and further in view of Takami et al., U.S. Patent 6, 503,657.

Skotheim teaches an electrolyte comprising a multifunctional monomer as described hereinabove. With respect to claims 31,36 & 38, the anode contains a lithium intercalated polyacetylene, polyphenylenes or polypyrrole. With respect to claims 32-33, the anode material may be selected from lithium intercalated carbon and lithium intercalated graphite (col. 21, lines 5-20). Regarding claims 34-35, the anodic lithium-aluminum alloy satisfies  $D_sE_tLi_u$ , when  $t=0$  (col. 21, lines 15-20). With respect to claims 39-41, the anode material includes lithium metal, lithium-tin or lithium-aluminum alloys (col. 21, lines 5-20).

Skotheim does not expressly disclose the anode having a current collector.

Takami teaches that it is conventional to employ current collectors to carry active material (col. 5, lines 33-35).

It would have been obvious to one of ordinary skill in the art at time the instant invention was made to employ the current collector of Takami in the anode of Skotheim, to collect current generated by the active material, support and provide structural integrity to negative electrode.

#### *Response to Arguments*

The double patenting rejection of instant claims 1-3, 8-10 & 15 -17 over claims 1, 26 & 27 of 09/862,621 of copending Application No. 09/862,621, is withdrawn due to the terminal disclaimer received October 2, 2003. The rejection of claims 1-21 as being obvious of Gan '546 in view of Peled '808, is overcome, because the references are silent to an electrolyte including a radically-polymerized monofunctional moner, multifunctional monomer or mixtures thereof. The rejection of claim 22 as being obvious of Gan '546 in view of Takami '657, is overcome, because the references are silent to an electrolyte including a radically-polymerized monofunctional moner, multifunctional monomer or mixtures thereof.

*Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Monique Wills whose telephone number is (571) 272-1309. The Examiner can normally be reached on Monday-Friday from 8:30am to 5:00 pm.




If attempts to reach Examiner by telephone are unsuccessful, the Examiner's supervisor, Randy Gulakowski, may be reached at 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mw

03/30/04

  
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